WHAT IS CLAIMED IS:

1. A method of dynamically determining a Raman gain profile of an optically amplified fiber optic span, said method comprising the steps of:

measuring a power profile for each of a plurality of system components;

transmitting the measured power profiles to a central location;

transmitting changes in the measured power profiles to the central location; and

dynamically calculating the Raman gain profile for the system based on the changes in the measured power profiles.

2. A method according to claim 1 further comprising, before said step of measuring a power profile for each of a plurality of system components, the step of:

applying one or more Raman pumps to said fiber optic span for providing additional optical amplification thereto.

3. A method according to claim 2 wherein power settings for the Raman pump are calculated relative to a loss profile of a fiber optic span measured under non traffic-carrying conditions in order to achieve a specified Raman gain profile.

A method according to claim 2 wherein said step of measuring a power profile for each of a plurality of system components includes measuring: an originating profile at an output of a transmit amplifier, a loss profile of a fiber optic span, and an incident profile at an input of a receive amplifier.

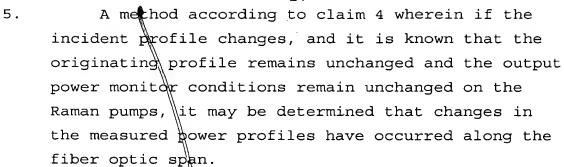
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6. A method according to claim 1 wherein the step
of transmitting changes in the measured power
profiles comprises conveying basic information over
an overhead channel.

7. A method according to claim 1 wherein the step of transmitting changes is performed when the magnitude of the change is outside limits defined by a tolerance band.

A method according to claim 1 wherein said step of measuring a power profile for each of a plurality of system components includes measuring: an originating profile at an output of a transmit amplifier, a loss profile of a fiber optic span, and an incident profile at an input of a receive amplifier.

A method according to claim 8 wherein the step of transmitting changes comprises conveying a status update on a regular basis from the transmit amplifier.

10. A method according to claim 8 wherein said step of dynamically calculating Raman gain profile comprises summing updated values of the incident profile and the loss profile, and subtracting therefrom the originating profile.

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- 11. A method according to claim 8 wherein said step of dynamically calculating the Raman gain profile is performed at said receive amplifier.
- 5 12. A system for dynamically determining a Raman gain profile of an optically amplified fiber optic span, said system comprising:

a plurality of optical spectrum analyzers for measuring power profiles of said fiber optic span and of a plurality of system components so as to determine the existence of a loss or a gain therein;

means for receiving the measured power profiles from the optical spectrum analyzers, and for receiving changes in the measured power profiles; and

means for dynamically calculating the Raman gain profile for the system based on the changes in the measured power profiles.

- 13. A system according to claim 12 further comprising an overhead channel for conveying the changes in the measured power profiles.
- 14. A system according to claim 12 further

 25 comprising a display means for displaying the result of said calculation.
 - 15. A system according to claim 12 wherein the means for receiving comprises a processor.

16. A system according to claim 12 wherein the means for dynamically calculating comprises a processor.

- A system according to claim 12 wherein the 17. means for receiving and the means for dynamically calculating are integral with one another.
- A system according to claim 12 wherein said 18. 5 system components include a transmit amplifier and a receive amplifier.
- A system according to claim 18 wherein said 19. means for receiving and said receive amplifier are 10 integral with one another.

A system according to claim 17 wherein said 20. means for receiving, said means for dynamically calculation, and said receive amplifier are all integral with one another.

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